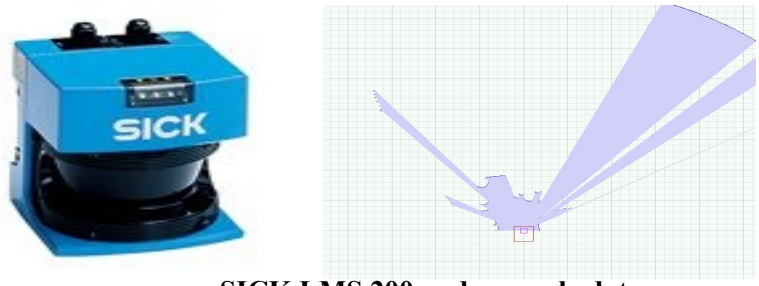
Laser Ranging

The SICK® LMS 200 is a 2-D laser range finder. It can map out a 180° area in front of the robot for up to 80 meters away. It can be used to detect obstacles and retro-reflective beacons.



SICK LMS 200 and example data.

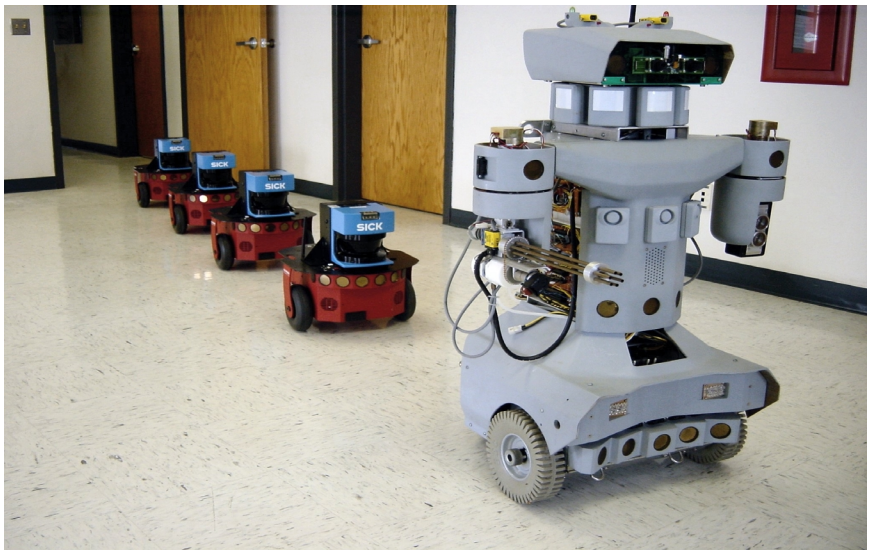
Barcodes

Retro-reflective beacons are used to form a 5-bit barcode. A unique barcode is placed on the back of each robot. This allows robots to follow each other and form a convoy.

Retro-reflective barcode.

Autonomous Mobile Communication Relays

SPAWAR
Systems Center
San Diego



Four autonomous relays follow ROBART-III, a multi-purpose security robot.

Problem and Solution

Controlling robots from outside of a building has always been a problem. Only a wireless link can give complete mobility to the robot, but it suffers from interference and limited range.

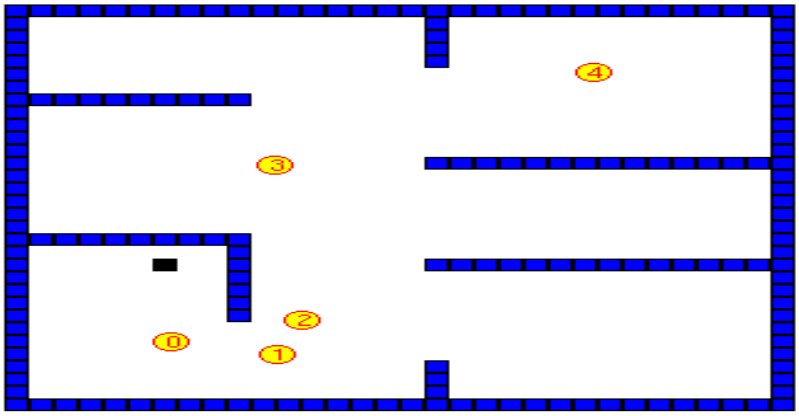
Autonomous Mobile Communication Relays will follow a lead robot into a building and will extend a robust, wireless network to the operator outside. These relays are completely autonomous and require no user interaction.

www.spawar.navy.mil/robots/research/amrr

SD 501, July 2003, SSC San Diego. Approved for public release; distribution is unlimited.

Convoy Behavior

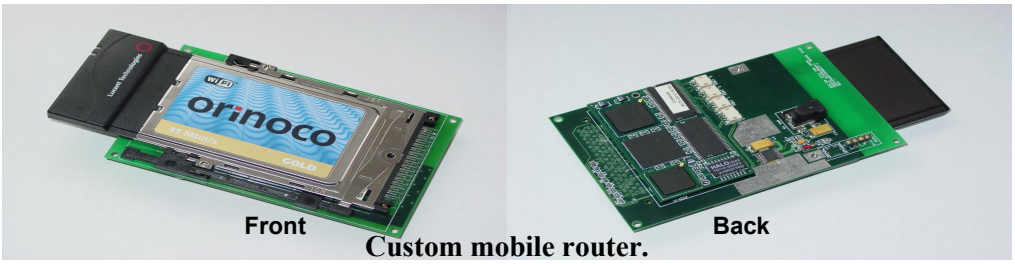
Convoying provides the fastest exploration. When the link between the operator and the closest relay starts to degrade, the relay stops in place and the rest of the convoy continues on. Digital networks operate on mainly line-of-sight links.



Relays maintain line-of-sight positions.

Robust Network

Custom 802.11 wireless routers allow the robots to maintain a network while in motion. Routing software was developed by BBN Technologies, Inc. Hardware was developed by SSC San Diego. These routers are being used in other projects.



Custom mobile router.